Pelagic Megafauna

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♦ Priority Issues:
- Catch and bycatch of pelagic fisheries
- Influence of oceanographic (physical as well as biological) processes on past, present and future abundance and distribution of seabirds, tunas, swordfish, cetaceans, pinnipeds
- Range expansion of pinnipeds
- Interaction of seabirds and marine mammals with human activities
- Effects of ecotourism (e.g., noise, oil, light)
- Ocean based anthropogenic effects
- Land based anthropogenic effects
- Environmental variability in climate and ocean processes
- Monitoring condition/health of pelagic megafauna (parasites, pollutant loads)
- Unforeseen events, and our ability to react quickly to them (e.g., unusual mortality events)
- Changes in the benthic habitat
- Distribution and abundance of all of these species
- Identify and monitor critical habitats and processes
- Life histories of pelagic megafauna and their prey
- Public education and perspective on Pelagic Megafauna

♦ *Characterization of Priority Questions*:

What are the past, present and future distribution and abundance patterns of pelagic megafauna in the MBNMS for sensitive species, caught species (i.e. species affected by human actions) and indicator species, and what are the major natural influences on the patterns with respect to biological interactions (e.g., predators, prey, and competition)?
Parameters - Occurrence and distribution and relative abundance of observable and/or catchable pelagic megafauna (e.g., murres, blue whales, tuna, leatherback turtles, pelagic sharks), combined with lat/long

Methods - Fishery independent using ship/aerial surveys, general net sampling, acoustics, beach surveys, advance technology (e.g., LIDAR), hook and line surveys, biological samples, use CalCOFI and other transects, compile archeo-faunal data; Fishery dependent using on-board observers, landings, aerial surveys of vessels, logbooks, GPS, biological samples
Spatial Scale - Point Reyes to Cambria, and 80 miles offshore, adaptable to objectives
Temporal Scale - Fishery Independent, indefinitely
Frequency - 3 to 6 per year (at least one per oceanographic season)
Existing Data/Programs - CDFG (e.g., dockside sampling), NMFS (e.g., rockfish surveys, marine mammal surveys, monitoring gillnet fisheries), Point Reyes Bird Observatory, Beach Surveys (Sanctuary Programs, MB/GFNMS), Moss Landing Bird, marine mammal, fishes and macro-invertebrate surveys
Additional Comments - Need oceanographic and climatic data from other programs (e.g., MBARI, NOAA, NASA, UCSC). Need specimens or life history work (feeding, growth and reproduction condition factors)

What are the past, present and future distribution and abundance patterns of pelagic megafauna in the MBNMS for sensitive species, caught species (i.e. species affected by human actions) and indicator species, and what are the major natural influences on the patterns with respect to physical and chemical processes, and climate and environmental variability?
Parameters - Thermal properties, clouds, wind speeds, currents, upwelling indices, chemical properties
Methods - XBTs, CTD profiles, SSTs using shipboard intake, bucket samples and satellites, ADCP, Drifters, AUV, CODAR, RADAR, ship transects with CTD/Rosette samples, standard measure of nutrients and trace elements, paleo-sediment studies of historic conditions
Spatial Scale - Point Reyes to Cambria, and 80 miles offshore, adaptable to objectives
Temporal Scale - Indefinitely
Frequency - 3 to 6 per year (at least one per oceanographic season)
Existing Data/Programs - Several that showed be integrated

What are the major influences of fisheries on distribution and abundance patterns of pelagic megafauna in the MBNMS?
Parameters - Catch data using location data, general techniques used, effort data (CPUE, depth, soak time, mesh length; Biological data using size composition, sex and age composition
Methods - Onboard observers, standard stock sampling, logbook, catch and landings (ID: discards and incidental catches of turtles, birds and mammals), time series analysis
Spatial Scale - Point Reyes to Cambria, as far offshore as necessary
Temporal Scale - Ongoing, indefinitely
Frequency - Concurrence with any fishery, dependent surveys and whenever pelagic fishery is in operation (statistically representative)
Existing Data/Programs - Shore surveys (Beachcombers), CDFG landings (Pink slips) NMFS some logbooks (e.g., albacore, swordfish), observers

What are the critical habitats for pelagic megafauna in the MBNMS and how do they change over time?

Parameters - Observable/catchable indicator species of pelagic megafauna with temperature, bathymetry, prey abundance, primary productivity, vessel traffic (human presence)
Methods - Shipboard and aerial surveys, monitoring fishing activity, remote-sensing, bioacoustics
Spatial Scale - Entire MBNMS
Temporal Scale - Oceanographic seasons, indefinitely
Frequency - One to two broad based per season, two to four focused surveys in critical habitats as defined by broad based surveys
Existing Data/Programs - CDFG, NMFS, MLML, UCSC, PRBO surveys
Additional Comments - Critical habitats are likely dynamic so there is a need to repeat sampling through time and space

What are the major land-based and ocean-based anthropogenic influences on the distribution and abundance patterns of pelagic megafauna in the MBNMS?
Parameters - Ocean based examining pollutants (e.g., noise, oil, solid waste), vessel traffic, water temperature (global warming); Land based examining pollutants (e.g., DDT, oil, PCBs)
Methods - Water samples for standard characteristic and contaminants, hydrophone array, beach surveys for solid waste, biopsy sampling, necropsies of dead animals, net sampling, vessel locations and fishing
Spatial Scale - Entire MBNMS
Temporal Scale - Indefinitely
Frequency - Monthly
Existing Data/Programs - CDFG, UCSC, Monterey and Santa Cruz County, beach surveys, NMFS, Stranding Network, USDA
Additional Comments - Recreational conflicts and anthropogenic effects